IQ TECHNOLOGIES, INC.

Smart Cable™

MODEL SB 1000

User Manual

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SMART SWITCH BOX

SSB1000 USER MANUAL

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INTRODUCTION

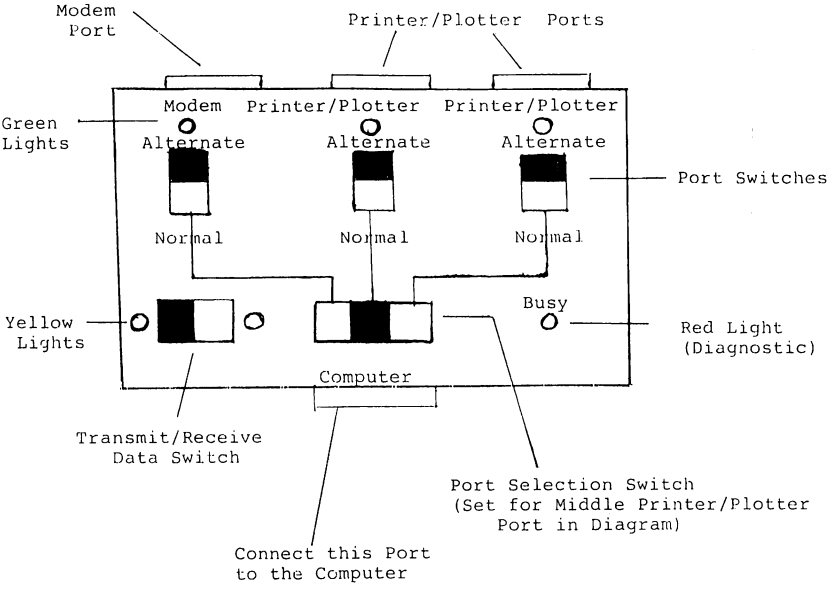
Smart Switch Box (SSB1000) is an intelligent connecting device capable of connecting as many as three RS232 asynchronous serial devices (such as a printer, modem, and plotter,etc.) to a computer at one time. This makes it possible to use many different computer peripherals without the need for break out boxes or custom cables. Its logic system figures out the required RS232 interface patterns and makes the correct connections, instantly.

The RS232 interface is the most common computer interface used today. However, a large number of interconnecting patterns are possible with an RS232 interface. Typically, a special cable must be built to accommodate each RS232 application.

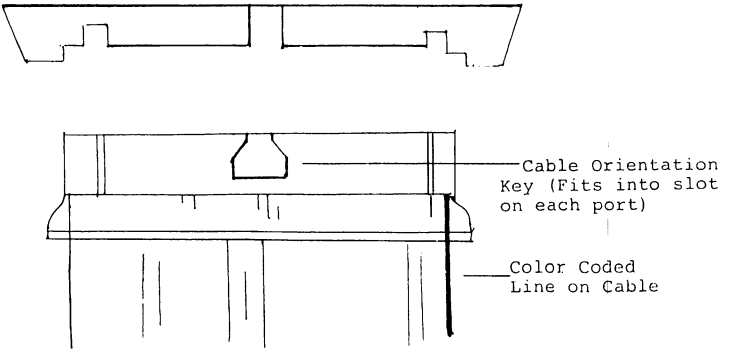
The Smart Switch Box eliminates the need for such special cables, saving you the time, money and effort required to build and debug them. All you do is plug in the Smart Switch Box between your computer and one to three devices, select a device and set two switches to make a connection. This Installation Guide will tell you how to set the switches to get your system up and running quickly.

The Smart Switch Box is ideal for computer users who want to connect a variety of peripherals to computers without the frustration and expense of using custom cables and constantly searching for the right cable.

SWITCH BOX DIAGRAM



PORT CLOSE-UP



QUICK OPERATING GUIDE

Note: If you are operating unfamiliar equipment, read the RS232 Checklist before you start.

1) Connect the computer to the computer port of the SSB1000 and a peripheral device to the port corresponding to the type of peripheral you are using, i.e., if you are using a modem, connect it to the modem port of the SSB1000. Use the two standard six-foot cables provided.

2) Power up both pieces of equipment and make sure no data is being sent.

3) Check to be certain that Baud rate, word length, and parity settings are matched between the two pieces of equipment. The Smart Switch Box is transparent to these settings which must be set correctly for equipment to work properly. (For clarification, see RS232 Checklist, Page 9)

4) Select the device to be used with the Port Selection Switch (see diagram). For example, when the switch is in the far left position, the left port labeled "modem" is used.

5) Set the port switch of the selected device to the normal position. Now look at the yellow lights and if they are both on, the transmit/receive data switch (between the yellow lights) is in the correct position. If only one yellow light is on, slide the switch to the other position. If both lights then come on, then that setting is correct.

   NOTE: If neither yellow lights come on, check the port on the computer. You are probably plugged into a parallel port. You should be plugged into a serial port. (On the IBM PC, the female 25 pin plug is a parallel port).

   NOTE: If only one yellow light is on in either switch position (this will be the case in a receive-only printer), try sending data in each position. The position that permits data flow is the correct position.

6) If the green light is on, slide the port switch to the alternate position.

7) If the red (busy) comes on, it is usually indicating that something is disabling data transfer (during data transfer the red light may flicker - this is normal). If the light remains on, you should check for sources of disabled data transfer. Please see section on Common Application Problems, Page 6.
   (Note: With the IBM PC the red light will remain on until data has been transferred at least once. Try your system. If data transfers with the red light on, your system is functioning properly).

Please see section on Common Application Problems, Page 6.

When all switches are set and the red light is off, the Smart Switch Box installation is complete. Leave the Smart Switch Box in place for as long as you want the peripherals connected. You can always use a different peripheral by following the installation procedure for the correct switch settings each time.

If your application is not working properly, please read the RS232 Checklist and Diagnostic Guide.

EXTENSION CABLES

The Smart Switch Box comes with two standard six foot cables. It is possible to use extension cables however, using 25-pin straight-through cables. An extension cable can be connected to a standard six foot cable coming from any port on the SSB1000, with the other end plugged into the device which is operating at a distance.

RS232 CHECKLIST

1) Does your equipment use EIA voltage levels?

The RS232 specification permits data transmission by voltage levels or the current loops. The SSB1000 is designed to operate at EIA voltage levels. If one yellow light comes on when you connect the SSB1000 to your computer, you have a EIA voltage level interface. (NOTE: Power must be on).

2) Are the computer and peripheral of the selected port using the same Baud rate?

Both interfacing devices using the RS232 must be handling data at the same rate. If not, the receiving device will misread the data, showing up as apparently random data on the printer or terminal.

Baud rates are set by hardware switches, or, in some newer equipment, software. Consult your equipment manual and set both to a common Baud rate.

3) Is the selected RS232 port using the same standard for encoding as the computer?

This is generally not a problem. The vast majority of equipment made today uses ASCII code. However, there is still some equipment that uses other codes for specific applications. If you are in doubt, consult your users manual or call the manufacturer.

4) Are both interfaces using error checking?

Modern equipment is very reliable, so that the convention of sending an error check bit with each character is less common.

The most common error checking scheme is called parity. Both interfaces must be set to the same error checking scheme. The choices are:

. . . No Parity: i.e., does not use error checking.
. . . Odd Parity
. . . Even Parity

The easiest way to get started is to select No Parity, or no error checking, on both interfaces. If you require error checking, it can be added later, after the system is running.

Remember that both interfaces must be the same: both No Parity, both Odd Parity, or both Even Parity.

5) Do both interfaces use the same word size (No. of bits per character?

Characters are commonly made up of 6, 7, and 8 bits. Again, both interfaces must use the same number of bits per character. This is relatively straightforward, except that a few manufacturers include the parity bit when they count the number of bits per character, which may cause some confusion. A good easy number is 8 bits per word with no parity.

6) Are both interfaces in the same transmission mode?

The choice here is between:

. . . Full duplex
. . . Half duplex

Both interfaces should be in the same mode: i.e., both in full duplex or both in half duplex. Symptoms of a transmission mode mismatch are when a printer or terminal prints or displays double characters; for instance, instead of printing READY, it would print RREEAADDYY. Another symptom is when a terminal can send data to the computer via keyboard, but does not display that data on the screen.

7) Do you have two-speed modem?

Some modems have two data transmission rates. The transmission rate may be selected by a switch on the modem or by a command from a computer or other peripheral. If the speed switch is not on the modem and your computer peripheral does not have the signal to select the speed, the SSB1000 will automatically set the modem to the high-speed data transmission rate.

8) Are you transferring data asynchronously or synchronously?

The majority of applications today require asynchronous data transfer. The Smart Cable is designed for this type of data transfer. The SSB1000 is not recommended for synchronous applications, although it will function in some situations.

AN EXAMPLE OF HOW TO TEST YOUR PRINTER CONNECTION

To set up the SSB1000 for a computer and peripheral operating under the CP/M operating system, follow these simple steps:

1) Power up the computer and peripheral.

2) Bring up CP/M System on screen by inserting a CP/M operating disk or exit from applications program to CP/M (for example, in Wordstar, press the X key).

   You will see the following prompt on the screen : A

3) The Baud rate (data rate) and parity must be set. The CP/M routines to do this have names like "SETUP", "CONFIGURE", "SET I/O", "STAT", "PORT", or other names.

4) Connect the SSB1000 as directed in the Quick Operating Guide Section, Page 3.

5) Set all switches as directed in Steps 4, 5 and 6 of the Quick Operating Guide Section, Page 3.

6) Type the following keys: CONTROL, P (This permits printing what is on the screen or typed).

7) Type DIR (return). DIR should print out as well as the disk directory. If not, try setting the switches again and testing with the DIR (return) command to print the directory.

8) Type CONTROL P after establishing the proper switch settings to stop further printing from the screen. The SSB1000 is now properly configured and you may run your programs.

DIAGNOSTIC GUIDE

This guide is divided into two sections: 1) Common Application Problems and 2): Debugging the RS232 Interface. If you are having problems getting your application to work properly, please check the following Common Application Problems, then use the debugging procedure that follows:

1. Common Application Problems

A. Printer Off-Line

Symptom: The Smart Switch Box's red (busy) light goes on when it is connected to the printer.

Problem: The printer is "off-line" or in "local".

Solution: Set printer to "on-line" or "remote" (whichever is applicable).

B. Buffer Full Polarity

Symptom: After sliding the port switch of the selected device to the alternative position, the red light goes on and the printer will not print any characters.

Problem: The "buffer full" signal line from the printer is the wrong polarity.

Solution: Put the port switch in the normal position. Your application should now work. If however, after printing some text, the printing becomes faulty, you must flip the switch that sets the buffer full signal polarity inside your printer. Refer to your printer manual. The switch may be called "buffer memory full", "reverse channel active", "supervisory send", or sometimes Pin 11 or Pin 19. Find the switch and flip it to the opposite position from the way it is now set. Follow the instructions given in Quick Operating Guide, Page 5.

C. Data Sent To Wrong Port

Symptom: Smart Cable lights indicate system is now ready to transfer data yet no text will print on printer. (Yellow lights do not flicker during data transfer as in normal use). Also screen will not display one character then stop.

Problem: Data from the computer is being sent to the wrong port.

Solution: Redirect the data to the correct port. The following example is for the IBM PC. Software for the IBM PC assumes the printer is connected to the parallel port. If you wish to connect to the serial port, follow these steps:

Start at MS-DOS "command level", that is, you should see the prompt A.

The following command sets the mode of operations for the printer.
Set the parameters according to your application.

MODE COM1: 1200,n,8,1,p (press return)

(Parameters used in our example: 1200 - Baud, n - no parity; 8 - 8 bits per character; 1 - 1 stop bit; p - asynchronous adapter)

Type the following command:

MODE LPT1: - COM1: (press return)

This redirects the data to the port called COM1.

Note: To test the connection right away, connect the cable end to the printer and type CTRL-P at the IBM PC keyboard. This causes all subsequent screen output to be sent to the printer as well. For example, enter the command DIR (return). The command DIR and the directory itself should be output to the screen and the printer simultaneously. Type another CTRL-P to return screen output to the screen only.

If your IBM PC has two RS232 ports you may have to direct to COM2. Use the above commands but replace COM1 with COM2.

2. Debugging the RS232 Interface

The SSB1000 has a red diagnostic light which indicates when data transfer is disabled. To determine which RS232 interface is causing a problem, disconnect the Smart Cable from one piece of equipment and check the red light status. If the red light is on, then the piece of equipment connected is causing the problem. If the red light is off, repeat the procedure with the other piece of equipment.

The source of the problem is indicated by the red light being on when the cable is attached to one piece of equipment. By determining which piece of equipment is disabling data transfer, you can focus your attention to that piece of equipment.

TECHNICAL ASSISTANCE

Further technical assistance is available by calling IQ TECHNOLOGIES, INC. at 1-800-232-8324 (outside Continental U.S. 1-206-451-0232).

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IQ TECHNOLOGIES, INC.
90 DAY LIMITED WARRANTY

a. Extension and Scope of Warranty. IQ Technologies , Inc. ("we") warrants to the orginal retail consumer purchasers of the "Smart Cable" Product ("you") that each such product will be free from defects in materials and workmanship for a period of 90 days from the date of purchase. This warranty does not apply to defects due, directly or indirectly, to misuse, abuse, negligence, accident, repairs or alterations outside our facilities, or to lack of maintenance.

b. Limitations. WE LIMIT ALL IMPLIED WARRANTIES INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABLILITY AND FITNESS TO 90 DAYS FROM THE DATE OUR PRODUCT WAS PURCHASED AT RETAIL. WE SHALL IN NO EVENT BE LIABLE FOR DEATH, INJURIES TO PERSONS OR PROPERTY OR FOR INCIDENTAL, CONTINGENT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING FROM USE OF THE SMART CABLE.

c. Your Duties. Within 30 days of the purchase of your Smart Cable, you must complete and mail to us at 11811 N.E. First Street, Bellevue, Washigton 98005, Attention: Customer Service Department (our "Factory Address"), the Registration Card attached to this warranty and which accompanied the product at the time of purchase. If the card was missing when you received the product, you must obtain the card from us within the same time period. YOUR FAILURE TO SO COMPLETE AND MAIL THE CARD WILL VOID THIS WARRANTY. You must give us written notice, at our Factory Address, of any defects before the expiration date of the ninety-day period, and, upon our request, make the defective product available to us, at your expense, at the address we designate.

d. Our Responsibilities. If you have filed your Registration Card within the 30-day period, and if you have notified us of the defect prior to the expiration of the warranty period, we will advise you of the location at which the product must be available to us. If our inspection uncovers a defect, we will either repair or replace the product, at our election, or we may refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return the repaired product or replacement at our expense, but if it is determined that there is no defect or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of repairing or replacing the product. We will inform you of the estimated charge and, at your option, you may either authorize repairs or request return of the unrepaired unit.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

USER WARRANTY CARD

Your Smart Cable Product carries a limited warranty for 90 days for replacement of defective parts under normal operating conditions.

SMART CABLE PRODUCT _____ DATE _____

OWNER'S NAME _____

COMPANY ADDRESS _____

CITY _____ STATE _____ ZIP _____

1) Your application is best described as: (please circle)
   a) programming
   b) systems integrator
   c) systems design
   d) computer sales/demo
   e) M.I.S./Finance
   f) home use
   g) office use (Dept. _____)
   h) other (please specify _____)

2) Equipment connected: (Please specify brand and model)

	COMPUTER	**with**	**PRINTER/PERIPHERAL**
a)	_____	with	_____
b)	_____	with	_____
c)	_____	with	_____
d)	_____	with	_____
e)	_____	with	_____

PLACE PURCHASED _____

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CITY _____ STATE _____ ZIP _____

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